Best Management Practices (BMP's)

Common Issues and Solutions

Dallas Grossman
Division of Water Quality
(701) 328-5242

NORTH DAKOTA
DEPARTMENT *of* HEALTH

Plan your BMP's **before** construction begins!!

The #1 BMP is common sense, but first you have to know what to use.

Educate yourself, your employees, your subcontractors, and all others involved with the project…education, education, education.

What type of BMP should I use?

1. What are the local and state requirements?
   - Cleaning streets
   - Types of BMP's that are allowed
2. How much area is disturbed?
3. Where is the disturbed area?
4. Will certain areas be disturbed or stabilized in the future?
5. Where does the site drain?
   - Waterbody (is it impaired for sediment)
   - Street (how much traffic is there, is it contractors or the public)
   - Field
   - Vacant lot (owned by you or someone else)
   - Somebody else's property

What type of BMP should I use?

6. What grade does the lot have?

   EX: If the base of a building is 4-inches higher than the edge of the property, then a BMP designed to pond water installed along the edge shouldn't be higher than 3-inches.

7. How much vegetation is left?
8. Where can vegetation be kept?
9. Are there any public safety issues?
   - Will ponding water in the street cause traffic safety problems
   - Will inlet protection in the street be a liability if run over
   - Will a stake used next to a sidewalk injure a person if they fell on it
10. Could ponding water cause property damage?
11. What types of soils are present?

Soil Type will Determine Detention Time

Ponding water allows sediment particles to settle out. Different soils settle at different rates. Sand can settle out in minutes, clay can take days.

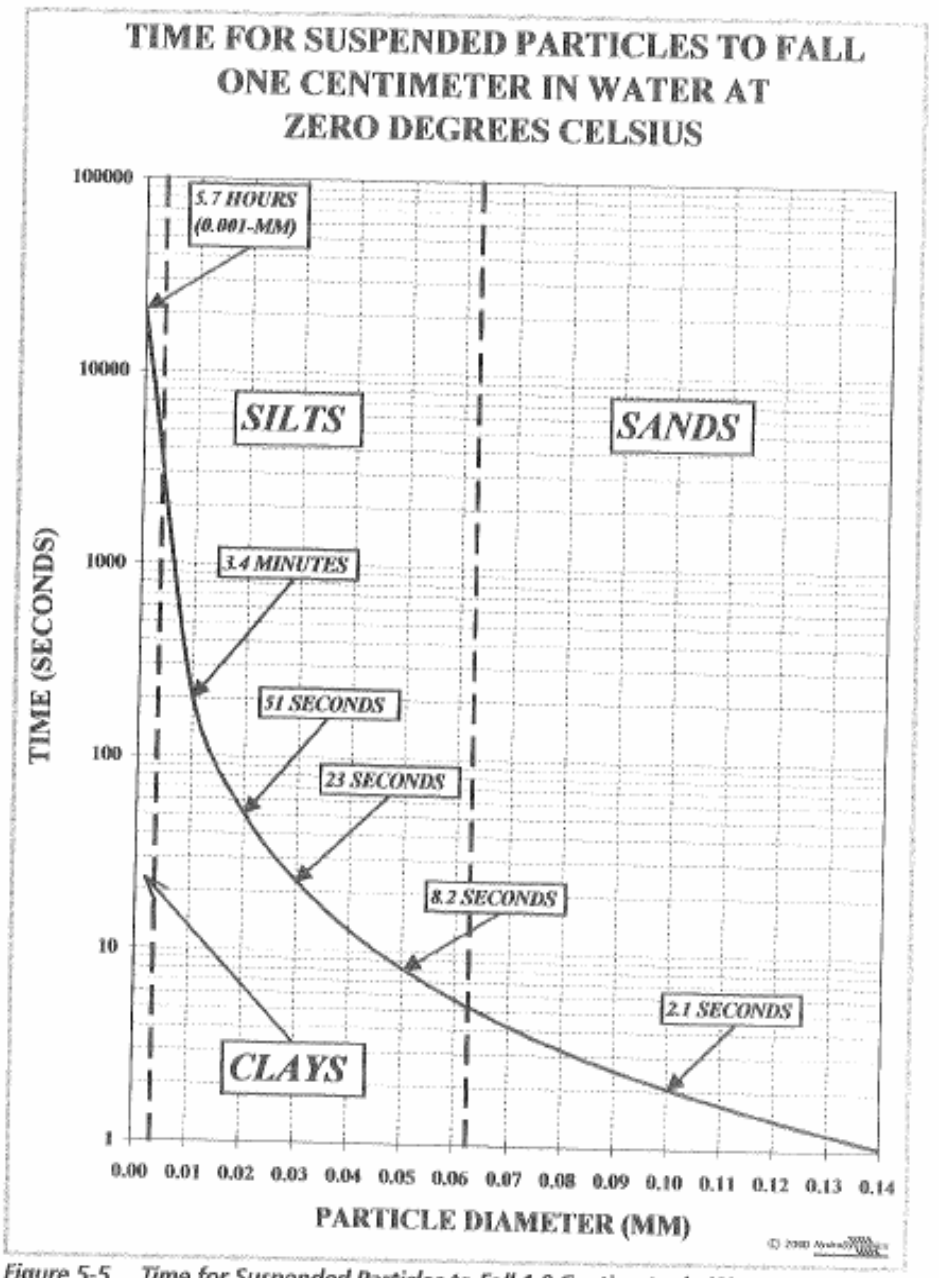


Figure 5-5. Time for Suspended Particles to Fall 1.0 Centimeter in Water at 0°C, As Calculated by Stokes' Law

Do I Use Erosion Control or Sediment Control?
What's the Difference?

- Erosion Control:
  - Used to reduce the cause of sediment lose
  - No soil in the runoff means clean runoff
  - You don't have to worry about water ponding on site
  - Requires phasing and timing…otherwise it won't work
  - Common controls include vegetation, stabilized soil and runoff diversion

- Sediment Control:
  - Used to capture sediment after it erodes
  - Require installation, maintenance and sometimes removal
  - Common controls include ponding and/or filtering runoff, reducing the velocity of runoff, and reducing tracked sediment

Vegetative Buffer Strips

Vegetative Buffer Strips

The buffer shall have a minimum width of 25 feet. This is adequate for areas with up to 125 feet of upslope disturbance. For every additional 5 feet of disturbance exceeding 125 feet and draining to the buffer, an additional 1 foot of width must be added to the buffer.

The width of the vegetative buffer shall have a slope that is less then 5%.

The disturbed area draining to the buffer shall have slopes that are 6% or less.

The buffer shall be densely vegetated prior to upslope disturbance. Dense vegetation is considered to be a stand of 3 – 12 inch high grassy vegetation that has a uniform coverage of at least 90% throughout the buffer. Woody vegetation shall not be counted for the 90% coverage. No more than 10% of the overall buffer may be comprised of woody vegetation.

Vegetative Buffer Strips

- Issues
  - Not respected
    - Employees, equipment, delivery vehicles tend to use them
  - Too Sparse
    - Not enough vegetation, 90% vegetation per square yard.

Barriers and Checks

- Bales
- Silt Fence
- Rock
- Brush
- Sediment Logs/Biorolls (i.e., straw wattles)
- Geotextile Dikes

Barriers and Checks

- Intended to pond water and slowly filter it.
- Consider the height of the device and the grade of the area.
- May be used to prevent wind erosion.
- Require installation, maintenance and sometimes removal.
- Must be installed correctly to be effective…otherwise your wasting your time and money.
- Captured sediment must be removed when it has reached one-third of the height of the device.

Barriers and Checks

Proper Installation methods:

- Install 1 linear foot of barrier for every 100 square feet of common drainage.
- Do not control more than ¼ acre per barrier.
- Silt fences must be trenched into the soil (notice the line).
- The soil on the upstream side must be compacted.
- Two silt fences must be attached by twisting them together, or by overlapping them at least 3 feet.

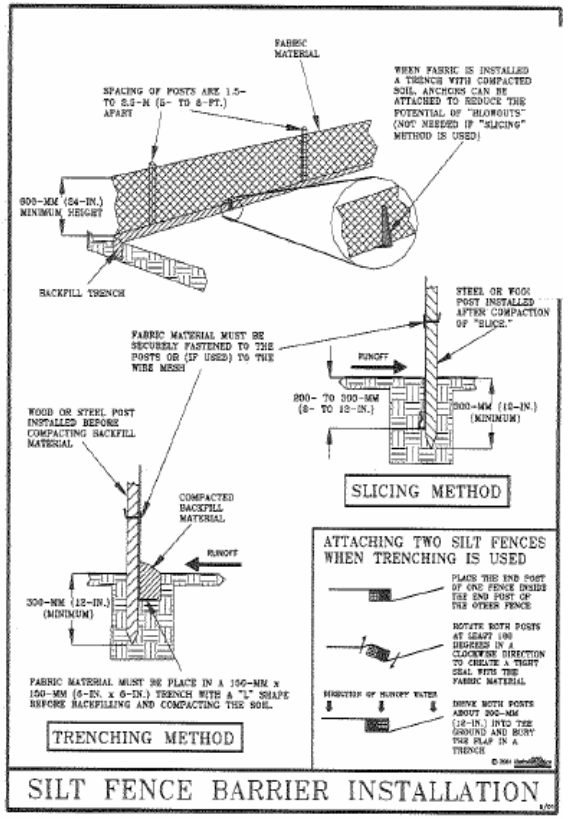


Figure 15. Installing a Silt Fence Barrier

Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors, Fifield, 2002

Barriers and Checks

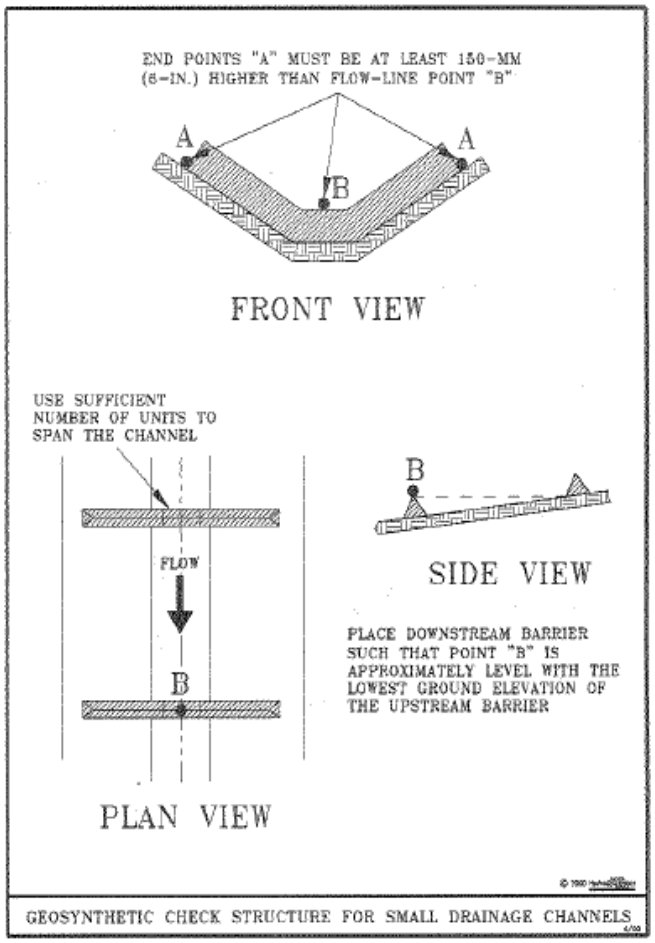


Figure 30. Geosynthetic Check Structure for Small Drainage Ditches

Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors, Fifield, 2002

Rule of Thumb:

- Runoff must flow over the top of the barrier and not around or underneath it.
- Turn the edges of the barrier uphill where possible.
- Install barriers at least 5 feet away from the toe of a slope, not at the toe.

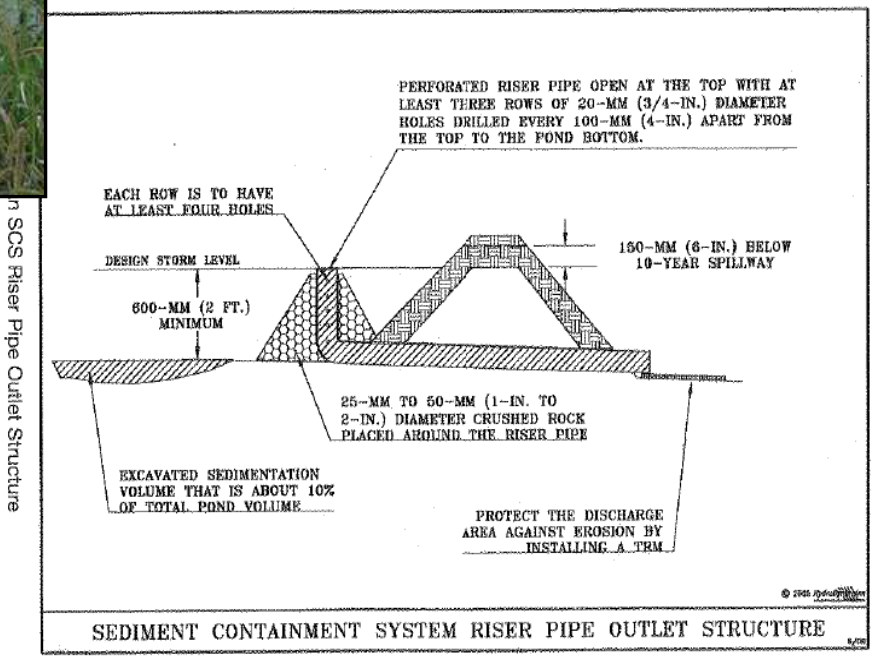
Barriers and Checks

- Wind is an issue with silt fence:
  - Secure lath on opposite side of posts

Sediment Ponds, Basins & Traps

- Intended to pond water and slowly filter it.
- Must be cleaned out once ½ of the containment volume is filled with sediment.
- All temporary sediment ponds, basins and traps must drain within 24 to 48 hours.
- Drawdown devices must be provided for all ponds and basins.
- All ponds and basins must have a stabilized overflow.
- Ponds and basins may require considerable area and should be planned ahead.
- Traps may be incorporated in different areas as construction progresses and require less area.

Pond with Rock Check Drawdown



n SCS Riser Pipe Outlet Structure

Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors, Fifield, 2002

Before

AFTER

Sediment Basins

Stabilized Overflow Needed

Sediment Traps

Sediment Traps

Inlet Protection

Inlet Protection

Inlet Protection

- Because of potential property damage and problems caused by flooded streets, inlet protection is considered a last resort.
- Other erosion and sediment controls must be installed upstream.
- All inlet protection devices must have overflows to prevent property damage during large rain events.

Other BMP’s

- Concrete Washout Areas
- Floating Silt Curtain
- Tracking Minimization
- Stockpile Protection
- Dewatering
- Downspouts
- Slope Drains
- Surface Roughening

Concrete Washout Area

- The recommended size should be a minimum of 6 cubic feet of containment volume for every 10 cubic yards of concrete poured.
- The washout area should be clearly marked.

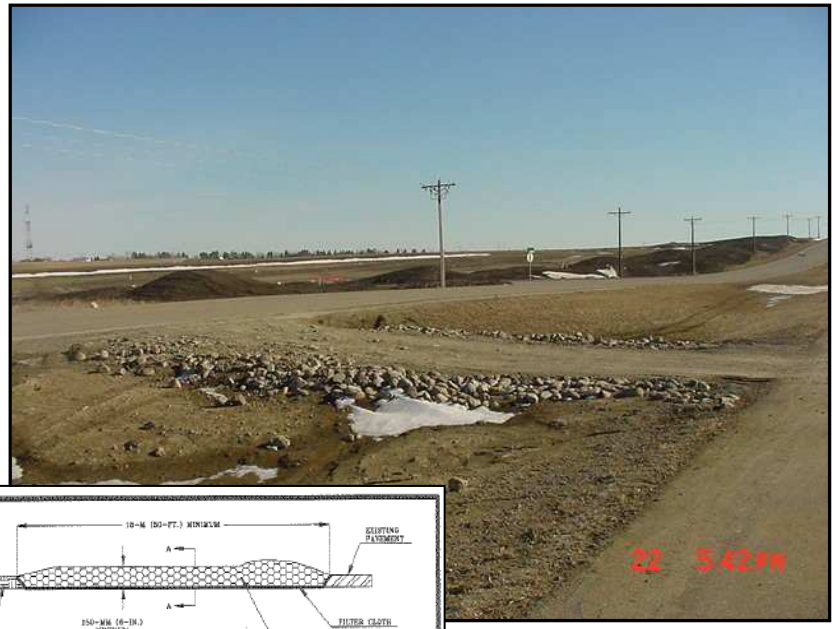
Floating Silt Curtain

Tracking Minimization

- Tracked sediment is the most noticeable issue and is the #1 complaint received by the NDDH.
- Can be reduced by not driving on site when it is muddy; park in the street instead.
- If you drive on site, clean as much mud off the tires as you can before leaving.
- The state says the streets must be cleaned within 48-hours. The City of Bismarck says the streets must be cleaned by the end of the day. The stricter rules apply within Bismarck's extraterritorial area.
- If continuous traffic enters and exits a site, then a stabilized access should be considered.

Stabilized Site Access

- Gravel or Crushed Rock
- Geotextile Fabric underneath prevents gravel from pushing into the soil
- Minimum of 50’ long
- Purpose is to shake mud of the tires
- Issues with larger rocks getting caught between duals
- Issues with gravel chipping windows



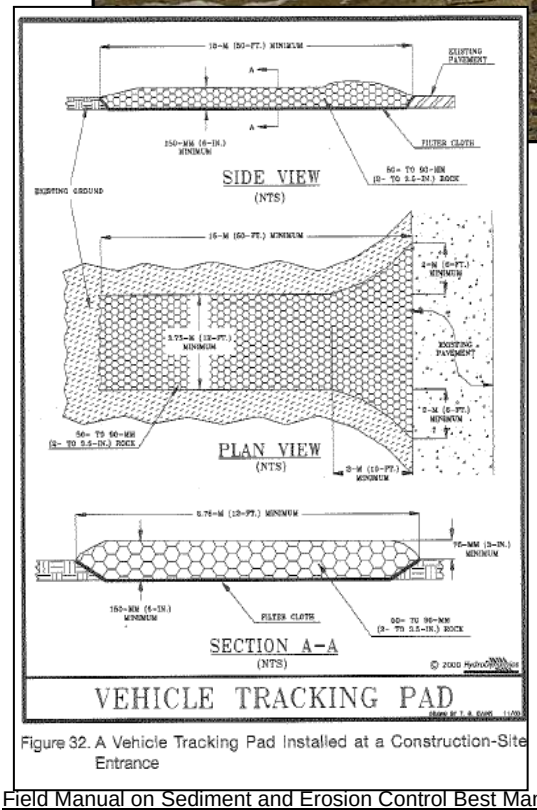


Figure 32. A Vehicle Tracking Pad Installed at a Construction-Site Entrance

Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors, Fifield, 2002

Stockpile Protection

- Temporarily seed the stockpile if it will remain in place for more than 21 days.
- Do not place stockpiles in a street, ditch or waterbody. Keep them at least 5 to 8 feet away.
- Do not install barriers at the toe of the stockpile. Sediment traps may be used instead.
- Sediment control is needed for piles next to an established lawn.
- Sediment control may not be needed for piles next to a field or in the middle of the site.

Dewatering

- A filter may be needed to dewater depending on how clean the water is.
- If possible, discharge to a vegetated area.
- Provide an energy dissipater for the discharge end.
- You may have use a filter at the inlet or discharge end (e.g., dewatering bag).

Downspouts

- Provide protection for downspouts

Rolled Erosion Control Products

- Prevents erosion in drainage ways such as channels and swales, and to protect slopes.
- Allows runoff to flow offsite.
- Comes in many different types depending on the use.
  - Made from straw, coconut fiber, geosynthetic material, etc….
  - Comes with or without netting.
  - Biodegradable or non-biodegradable
  - Photodegradable or non-photodegradable
  - Lasts for months or years
- Commonly used in finished areas or in place of barriers where grades are 7% or steeper.

Rolled Erosion Control Products

- Always compact and backfill the uphill side of a blanket.
- Overlap at least 6 inches of the upstream blanket over the downstream blanket.
- Make sure the run-on is stabile or it will undermine your blanket.
- Select blankets that will withstand run-on.

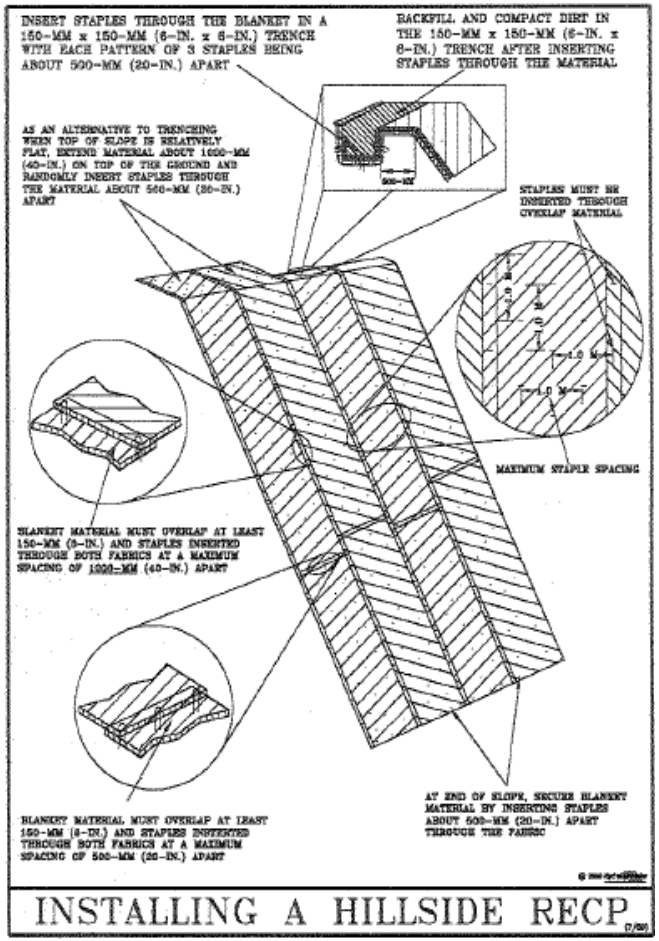


Figure 36. Installing an RECP on a Hillside

Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors, Fifield, 2002

27th St. Overpass, Minot: Wold Engineering

27th St. Overpass, Minot: Wold Engineering

Surface Roughening

- **Created with tracked equipment or plow.**
- **Used to reduce the velocity of the runoff.**
- **Allows water to soak in easily.**
- **Easier to seed.**
- **Less wind erosion.**


Mulch

Seeding

Temporary or Permanent?

- Apply permanent seed to sites that will not be disturbed for 2 years.
- Apply temporary seed to all other sites.

Temporary Seeding


Mix and match BMP's
– Straw Wattles
– Hydroseed
– Erosion Control Blanket
12 12:28PM


The End,
Questions?
12 12:28PM